IN THE CLAIMS:

These claims will replace all prior versions of claims in the present application.

1. (Previously Presented) An isolated DNA molecule comprising a nucleotide sequence that encodes a biologically active protamine polypeptide or functional fragment thereof including an amino acid sequence selected from the group consisting of:

(a) amino acid sequences extending from position 9 to position 18, from position 9 to position 20, from position 9 to position 21, from position 9 to position 22, from position 9 to position 23, from position 10 to position 20, from position 10 to position 21, from position 10 to position 22, from position 10 to position 23, and from position 10 to 24 of SEQ ID NO. 2; and

(b) amino acid sequences as set out in SEQ ID NOS. 14, 16, 18, 20, 22, 24, and 26.

2. (Previously Presented) An isolated DNA molecule comprising a nucleotide sequence that encodes a biologically active protamine polypeptide or functional fragment thereof, wherein the nucleotide sequence is selected from the group consisting of:

(a) nucleic acid sequences encoding amino acid sequences extending from position 9 to position 18, from position 9 to position 20, from position 9 to position 21, from position 9 to position 22, from position 9 to position 23, from position 10 to position 20, from position 10 to position 21, from position 10 to position 22, from position 10 to position 23, and from position 10 to 24 of SEQ ID NO. 2; and

(b) nucleic acid sequences as set out in SEQ ID NOS. 13, 15, 17, 19, 21, 23, and 25; and

(c) nucleic acid sequences as set out in SEQ ID NOS. 28, 29, 30, 31, and 32.

3. (Previously Presented) An isolated DNA molecule providing an expression cassette capable of directing the expression of a biologically active protamine polypeptide or functional fragment thereof in a suitable host, wherein said expression cassette comprises from 5' to 3':

(a) a promoter capable of expressing a downstream coding sequence in a suitable host;

(b) a DNA sequence coding for the expression of a biologically active protamine polypeptide or functional fragment thereof; and

(c) a 3' termination sequence.

4. (Previously Presented) Isolated DNA molecule according to claim 3, wherein the DNA sequence (b) is selected from the group consisting of:

(a) a nucleotide sequence that encodes a biologically active protamine polypeptide or functional fragment thereof including an amino acid sequence selected from the group consisting of:

(i) amino acid sequences extending from position 9 to position 18, from position 9 to position 20, from position 9 to position 21, from position 9 to position 22, from position 9 to position 23, from position 10 to position 20, from position 10 to position 21, from position 10 to position 22, from position 10 to position 23, and from position 10 to 24 of SEQ ID NO. 2;

(ii) amino acid sequences as set out in SEQ ID NOS. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, and 26;

(iii) amino acid sequences derived from SEQ ID NO. 33;

(b) nucleic acid sequences as set out in SEQ ID NOS. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, and 25; and

(c) nucleic acid sequences as set out in SEQ ID NOS. 27, 28, 29, 30, 31, and 32.

5. (Currently Amended) Isolated DNA molecule according to ~~any of the preceding claims~~ claim 1, wherein the coding nucleotide sequence is a cDNA, genomic or manufactured DNA sequence.

6. (Currently Amended) Isolated DNA molecule according to ~~any of claims 3 to 5~~ claim 3, wherein the coding nucleotide sequence is fused with a suitable signal peptide encoding sequence.

7. (Currently Amended) Isolated DNA molecule according to ~~any of claims 3 to 6~~ claim 3, wherein the promoter and/or the coding nucleotide sequence(s) are selected to ensure expression in an eucaryotic host.

8. (Currently Amended) Isolated DNA molecule according to ~~any of claims 3 to 6~~ claim 3, wherein the promoter and/or the nucleic acid sequence are selected to ensure expression in a procaryotic host.

9. (Currently Amended) Isolated DNA molecule according to claim 7 ~~or 8~~, wherein the promoter is an inducible promoter.

10. (Currently Amended) A plasmid or vector system comprising one or more DNA molecules according to ~~any of claims 1 to 9~~ claim 1.

11. (Currently Amended) A procaryotic or eucaryotic host cell, seed, tissue or whole organism transformed or transfected with the DNA molecule according to ~~any of claims 3 to 9~~ claim 3 ~~or with the plasmid or vector system according to claim 10~~ in a manner enabling said host cell, seed, tissue or whole organism to express a protamine polypeptide or functional fragment thereof.

12. (Previously Presented) The procaryotic or eucaryotic host cell, seed, tissue or whole organism according to claim 11 selected from the group consisting of bacteria, fungi including yeast, insect, animal and plant cells, seeds, tissues or whole organisms.

13. (Previously Presented) The procaryotic host cell or whole organism according to claim 12 being a bacterium selected from the group consisting of proteobacteria including members of the alpha, beta, gamma, delta and epsilon subdivision, gram-positive bacteria including Actinomycetes, Firmicutes, Clostridium and relatives, flavobacteria, cyanobacteria, green sulfur bacteria, green non-sulfur bacteria, and archaea.

14. (Previously Presented) The procaryotic host cell or whole organism according to claim 13 belonging to the group of proteobacteria selected from the group consisting of Agrobacterium, Rhodospirillum, Rhodopseudomonas, Rhodobacter, Rhodomicrobium, Rhodopila, Rhizobium, Nitrobacter, Aquaspi-rillum, Hyphomicrobium, Acetobacter, Beijerinckia, Paracoccus, Pseudomonas, ammonia-oxidizing bacteria such as Nitrosomonas, Enterobacteriaceae, Myxobacteria such as Myxococcus, with Rhodopseudomonas, Pseudomonas and Escherichia being preferred, and with Rhodopseudomonas palustris, Pseudomonas fluorescens, and Escherichia coli, respectively, being most preferred.

15. (Previously Presented) The procaryotic host cell or whole organism according to claim 13 belonging to the group of gram-positive bacteria selected from the group consisting of Actinomycetes and Firmicutes including Clostridium and relatives such as Bacillus and Lactococcus, with Bacillus subtilis and Lactococcus lactis being preferred.

16. (Previously Presented) The procaryotic host cell or whole organism according to claim 13 belonging to the group of flavobacteria selected from the group consisting of Bacteroides, Cytophaga and Flavobacterium, with Flavobacterium such as Flavobac-terium ATCC21588 being preferred.

17. (Previously Presented) The procaryotic host cell or whole organism according to claim 13 belonging to the group of cyanobacteria selected from the group consisting of Chlorococcales including Synechocystis and Synechococcus, with Synechocystis sp. and Synechococcus sp. PS717 being preferred.

18. (Previously Presented) The procaryotic host cell or whole organism according to claim 13 belonging to the groups of green sulfur bacteria or green non-sulfur bacteria selected from Chlorobium or Chloroflexaceae such as Chloroflexus, respectively, with Chlorobium limicola f. thiosulfatophilum and Chloroflexus aurantiacus, respectively, being preferred.

19. (Previously Presented) The procaryotic host cell or whole organism according to claim 13 belonging to the group of archaea selected from Halobacteriaceae such as Halobacterium, with Halobac-terium salinarum being preferred.

20. (Previously Presented) The eucaryotic host cell or whole organism according to claim 12 being fungi including yeast selected from the group consisting of Ascomycota including Saccharomycetes such as Pichia and Saccharomyces, and anamorphic Ascomycota including Aspergillus, with Saccharomyces cerevisiae and Aspergillus niger being preferred.

21. (Previously Presented) The eucaryotic host cell according to claim 12 being an insect cell selected from the group consisting of SF9, SF21, Trychplusiani and MB21.

22. (Previously Presented) The eucaryotic host cell according to claim 12 being an animal cell selected from the group consisting of Baby Hamster Kidney (BHK) cells, Chinese Hamster Ovarian (CHO) cells, Human Embryonic Kidney (HEK) cells and COS cells, with NIH 3T3 and 293 being most preferred.

23. (Previously Presented) The eucaryotic host cell, seed, tissue or whole organism according to claim 12 being a plant cell, seed, tissue or whole organism selected from the group consisting of eukaryotic alga, embryophytes comprising *Bryophyta*, *Pteridophyta* and Spermatophyta such as *Gymnospermae* and *Angiospermae*, the latter including *Magnoliopsida*, *Rosopsida*, and *Liliopsida* ("monocots").

24. (Currently Amended) A method of transforming or transfecting a prokaryotic or eucaryotic host cell, seed, tissue or whole organism according to ~~any of claims 11 to 23~~ claim 11 in order to yield transformants or transfectants capable of expressing a protamine polypeptide or functional fragment thereof, comprising the transformation or transfection of said host cell, seed, tissue or whole organism with a DNA molecule according to any of claims 3 to 9, or with a plasmid or vector system according to claim 10.

25. (Previously Presented) A transformed or transfected host cell, seed, tissue or whole organism represented by or regenerated from transformants or transfectants yielded according to claim 24.

26. (Previously Presented) Method for the production of a biologically active protamine polypeptide or functional fragment thereof, comprising the steps of:

(a) culturing a transformed or transfected host cell, seed, tissue or whole organism according to claim 25 under suitable conditions allowing production of said polypeptide or functional fragment within said host; and, optionally,

(b) isolating said polypeptide or functional fragment from said host or from its culture medium.

27. (Currently Amended) Method according to claim 26, wherein said transformed or transfected host cell is selected from prokaryotes ~~according to any of claims 11 to 19~~, with Rhodopseudomonas palustris, Pseudomonas fluorescens, and Escherichia coli being preferred, and wherein said polypeptide or functional fragment is isolated after induction of a log phase culture with a suitable inducing agent.

28. (Previously Presented) Method according to claim 27, wherein said polypeptide or functional fragment is isolated until said host cell re-enters log phase.

29. (Previously Presented) Bacteriocidal, bacteriostatic, fungicidal and/or fungistatic composition comprising or consisting essentially of citrate and bicarbonate.

30. (Previously Presented) Composition according to claim 29, further comprising phosphate.

31. (Currently Amended) Composition according to claim 29 ~~or 30~~, further comprising a basic protein or peptide selected from the group consisting of protamines, protamine sulphates, defensins, magainins, mellitin, cecropins and protegrins.

32. (Previously Presented) Composition according to claim 31, wherein the basic protein or peptide is protamine or protamine sulphate.

33. (Previously Presented) Composition according to claim 32, wherein a suitable biologically active protamine or functional fragment thereof can be selected from the group consisting of proteins, polypeptides or peptides representing or comprising amino acid sequences extending from position 9 to position 18, from position 9 to position 20, from position 9 to position 21, from position 9 to position 22, from position 9 to position 23, from position 10 to position 20, from position 10 to position 21, from position 10 to position 22, from position 10 to position 23, and from position 10 to 24 of SEQ ID NO. 2; amino acid sequences as set out in SEQ ID NOS. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, and 26; amino acid sequences derived from SEQ ID NO. 33; amino acid sequences being encoded by nucleic acid sequences as set out in SEQ ID NOS. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, and 25; and amino acid sequences being encoded by nucleic acid sequences as set out in SEQ ID NOS. 27, 28, 29, 30, 31, and 32.

34. (Currently Amended) Composition according to ~~any of claims 29 to 33~~ claim 29, further comprising lysozyme.

35. (Currently Amended) Composition according to ~~any of claims 29, and 31 to 34~~ claim 29, wherein citrate and bicarbonate are present in a molar ratio of 4:1, and wherein the preferred amounts of citrate and bicarbonate are at least 0.04 M and 0.01 M, respectively.

36. (Currently Amended) Composition according to ~~any of claims 30 to 34~~ claim 30, wherein citrate, bicarbonate and phosphate are present in a molar ratio of 2:1:1, and wherein the preferred amounts of citrate, bicarbonate and phosphate are at least 0.2 M, 0.1 M and 0.1 M, respectively.

37. (Currently Amended) Composition according to ~~any of claims 31 to 36~~ claim 31, wherein the basic protein or peptide is present in an amount of at least 0.1 µg.

38. (Currently Amended) Composition according to ~~any of claims 32 to 37~~ claim 32, wherein lysozyme is present in an amount of at least 0.1 µg.

39. (Currently Amended) Composition according to ~~any of claims 29, 31 to 35, 37 and 38~~ claim 29, in liquid form, obtained by admixing an at least 0.01 mol/l citrate solution adjusted to pH 6.0 to 7.0 with an at least 0.01 mol/l bicarbonate solution in a ratio of 4:1 (vol./vol.).

40. (Currently Amended) Composition according to ~~any of claims 30 to 34~~ claim 30, ~~and 36 to 38~~ in liquid form, obtained by admixing an at least 0.01 mol/l citrate solution adjusted to pH 6.0 to 7.0 with an at least 0.01 mol/l bicarbonate solution and an at least 0.01 mol/l phosphate solution adjusted to ph 6.0 to 7.0 in a ratio of 2:1:1 (vol./vol.).

41. (Currently Amended) Composition according to claim 39 ~~or 40~~ in liquid form, comprising protamine in a concentration of at least 0.1 µg/ml.

42. (Currently Amended) Composition according to ~~any of claims 39 to 41~~ claim 39, comprising Lysozyme in a concentration of at least 0.1 µg/ml.

43. (Previously Presented) Protamine polypeptide or peptide having amino acid sequences extending from position 9 to position 18, from position 9 to position 20, from position 9 to position 21, from position 9 to position 22, from position 9 to position 23, from position 10 to position 20, from position 10 to position 21, from position 10 to position 22, from position 10 to position 23, or from position 10 to 24 of SEQ ID NO. 2.

44. (New) A procaryotic or eucaryotic host cell, seed, tissue or whole organism transformed or transfected with the plasmid or vector system according to claim 10 in a manner enabling said host cell, seed, tissue or whole organism to express a protamine polypeptide or functional fragment thereof.

45. (New) Composition according to claim 30, further comprising a basic protein or peptide selected from the group consisting of protamines, protamine sulphates, defensins, magainins, mellitin, cecropins and protegrins.

46. (New) Composition according to claim 40 in liquid form, comprising protamine in a concentration of at least 0.1 μg/ml.